

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) A changeable lock assembly that can be reconfigured to operate with different keys of a set of user keys, without disassembling the lock, comprising:
 - a) a set of keys, the set of keys comprising at least a first user key having a first contour edge that operates the lock in a first lock configuration but does not operate the lock in a second lock configuration, and a second user key having a second contour edge that operates the lock in the second lock configuration but does not operate the lock in the first lock configuration, wherein the first contour edge and the second contour edge have at least a first contour position and a second contour position that are differently configured;
 - b) a housing having a generally cylindrical bore with an inner surface and a plurality of generally cylindrical driver chambers intersecting the bore surface;
 - c) a plurality of generally cylindrical drivers, each driver having a diameter and being positioned and movable within one driver chamber, and being urged toward the bore surface;
 - d) a plug having a generally cylindrical periphery and rotatably mounted within the bore so as to form a shear line at the interface of the bore surface and the plug periphery, the plug further having:
 - 1) a longitudinal axis;
 - 2) a keyway intersecting the periphery and parallel to the longitudinal axis and configured to receive a key selected from the set of keys;
 - 3) a plurality of generally cylindrical tumbler chambers intersecting the periphery and the keyway, and being generally orthogonal to the longitudinal axis, each tumbler chamber being aligned with a driver chamber when the plug is at a first rotated position with respect to the housing so as to form a pin chamber; and
 - 4) a plurality of retainer cavities intersecting the periphery, each retainer cavity being spaced apart from a corresponding tumbler chamber and aligned with a corresponding driver chamber when the plug is at a second rotated position with respect to the housing, each retainer cavity having an opening of a size smaller than the diameter of the driver, wherein the driver can not enter through the opening and into the retainer cavity when the plug is in its second rotated position; and

- 5) a change tool slot configured parallel to the longitudinal axis, that extends from the front face of the plug and intersects a portion of each of the plurality of retainer cavities;
- e) ~~one~~ a separate change tool having a blade portion with an upper edge that intersects all of the plurality of retainer cavities when the change tool is inserted within the change tool slot;
- f) a plurality of tumblers, each tumbler being positioned and movable within one tumbler chamber; and
- g) a plurality of lock configuration change balls, each change ball being associated with one pin chamber, having a first position within the pin chamber between the driver and tumbler, and a second position within the retainer cavity,

wherein when the plug is in the second rotated position and the change tool is inserted within the change tool slot, the upper edge of the change tool raises all of the plurality of change balls when disposed in ~~all of~~ the respective retainer cavities to a position where, upon subsequent rotation of the plug away from the second rotated position, all of the raised change balls are isolated in the corresponding driver chambers.

2. (original) The changeable lock assembly of Claim 1 wherein the first contour position of the first key is a lower position and the second contour position of the first key is a raised position, and wherein, when the lock is configured to operate with the first key, a first change ball corresponding to the first contour position is disposed in its pin chamber, and a second change ball corresponding to the second contour position is disposed in its retainer cavity.

3. (original) The changeable lock assembly of Claim 2 wherein the first contour position of the second key is a raised position and the second contour position of the second key is a lower position, wherein the driver that is disposed in the pin chamber corresponding to the second contour position spans across the shear line when the second key is inserted into the keyway, whereby the plug can not rotate within the housing, such that the second key can not operate the lock.

4-44. (canceled)

45. (previously presented) The changeable lock assembly of Claim 1 wherein the lock is operable with a user key only when the change tool is remote from the change tool slot.

46.-47. (canceled)

48. (previously presented) The changeable lock assembly of claim 1 wherein the change tool has a linear upper edge.

49. (canceled)

50. (currently amended) The changeable lock assembly of claim 1, wherein the set of keys further comprises a programming key having a contour edge configured to raise all of the change balls, when disposed in [[a]] the associated tumbler chambers, above the shear line upon its insertion into the keyway, and, upon its operation of the lock, to move the change balls into the respective retainer cavities upon rotation of the plug to its second rotated position, wherein the lock can be operated with the programming key, but not with the user keys.

51. (previously presented) The changeable lock assembly of Claim 1 wherein at least one change ball is disposed in the second position to configure the lock for operation with one of the user keys.

52. (canceled)

53. (previously presented) The changeable lock assembly of Claim 1 further comprising a plurality of master shims, wherein one of the plurality of master shims is disposed between each tumbler and the change ball when the change ball is in its first position, the master shims having a first diameter and the retainer cavity having a second diameter, the first diameter being greater than the second diameter.

54. (previously presented) The changeable lock assembly of Claim 53 further comprising a master key having a contour edge configured to raise the plurality of master shims

above the shear line, wherein any change ball positioned above the master shims can not be deposited into the retainer cavity in the second rotated position.

55. - 59. (canceled)

60. (currently amended) A changeable lock assembly that can be reconfigured to operate with different keys of a set of user keys, without disassembling the lock, comprising:

a) a set of keys, the set of keys comprising at least a first key having a first contour edge that operates the lock in a first lock configuration but does not operate the lock in a second lock configuration, and a second key having a second contour edge that operates the lock in the second lock configuration but does not operate the lock in the first lock configuration, wherein the first contour edge has at least a first contour position and a second contour position that are differently configured than the first contour position and second contour position of the second contour edge;

b) a housing having a cylindrical bore with an inner surface and a plurality of generally cylindrical driver chambers intersecting the inner surface;

c) a plurality of cylindrical drivers, each driver being positioned and movable within one driver chamber and being urged toward the bore surface;

d) a plug having a cylindrical periphery and rotatably mounted within the bore so as to form a shear line at the interface of the bore surface and the plug periphery, the plug further having:

1) a keyway configured to receive a key selected from the set of keys;

2) a plurality of cylindrical tumbler chambers intersecting the periphery and the keyway, each tumbler chamber being aligned with a driver chamber when the plug is at a first rotated position with respect to the housing so as to form a pin chamber; and

3) a plurality of retainer cavities intersecting the periphery, each retainer cavity being spaced apart from a corresponding tumbler chamber and aligned with a corresponding driver chamber when the plug is at a second rotated position with respect to the housing, each retainer cavity having an opening of a size smaller than the diameter of the driver, wherein the driver can not enter through the opening and into the retainer cavity when the plug is in its second rotated position; and

4) a change tool slot that intersects a portion of each of the retainer cavities; and

5) ~~one~~ a change tool having a blade portion with a linear upper edge that intersects all of the plurality of retainer cavities when inserted within the change tool slot;

e) a plurality of tumblers, each tumbler being positioned and movable within one tumbler chamber; and

f) a plurality of lock configuration change balls, each change ball being associated with one pin chamber, having a first position within the pin chamber between the driver and tumbler, and a second position within the retainer cavity;

wherein when the plug is in the second rotated position and the change tool is inserted within the change tool slot, the linear upper edge of the change tool raises all of the plurality of change balls, when disposed in ~~all of~~ the respective retainer cavities, to a position where, upon subsequent rotation of the plug away from the second rotated position, all raised change balls are isolated in the corresponding driver chambers.

61. (canceled)

62. (previously presented) The changeable lock assembly of Claim 61 wherein the lock is operable with a user key only when the change tool is remote from the change tool slot.

63. (canceled)

64. (previously presented) The changeable lock assembly of Claim 60 wherein at least one change ball is disposed in the second position to configure the lock for operation with one of the user keys.

65.-76. (canceled)

77. (currently amended) The changeable lock assembly according to Claim 1 wherein the upper edge of the inserted change tool raises at least the centerline of all of the plurality of change balls when disposed in ~~all of~~ the respective retainer cavities above the shear line.

78. (currently amended) The changeable lock assembly according to Claim 60 wherein the linear upper edge of the inserted change tool raises at least the centerline of all of the plurality of change balls, when disposed in ~~all of~~ the respective retainer cavities, above the shear line.

79. (previously presented) The changeable lock assembly of Claim 1, wherein the number of the plurality of drivers and the plurality of tumblers is six and more.

80. (previously presented) The changeable lock assembly of Claim 60, wherein the number of the plurality of drivers and the plurality of tumblers is six and more.

81. (currently amended) A changeable lock assembly that can be reconfigured to operate with different keys of a set of user keys, without disassembling the lock, comprising:

a) a set of keys, the set of keys comprising at least a first user key having a first contour edge that operates the lock in a first lock configuration but does not operate the lock in a second lock configuration, and a second user key having a second contour edge that operates the lock in the second lock configuration but does not operate the lock in the first lock configuration, wherein the first contour edge and the second contour edge have at least a first contour position and a second contour position that are differently configured;

b) a housing having a generally cylindrical bore with an inner surface and a plurality of generally cylindrical driver chambers intersecting the bore surface;

c) a plurality of generally cylindrical drivers, each driver having a diameter and being positioned and movable within one driver chamber, and being urged toward the bore surface;

d) a plug having a generally cylindrical periphery and rotatably mounted within the bore so as to form a shear line at the interface of the bore surface and the plug periphery, the plug further having:

- 1) a longitudinal axis;
- 2) a keyway intersecting the periphery and parallel to the longitudinal axis and configured to receive a key selected from the set of keys;
- 3) a plurality of generally cylindrical tumbler chambers intersecting the periphery and the keyway, and being generally orthogonal to the longitudinal axis, each tumbler chamber being aligned with a driver chamber when the plug is at a first rotated position with respect to the housing so as to form a pin chamber; and
- 4) a plurality of retainer cavities intersecting the periphery, each retainer cavity being spaced apart from a corresponding tumbler chamber and aligned with a corresponding driver chamber when the plug is at a second rotated position with respect to the housing, each retainer cavity having an opening of a size smaller than

the diameter of the driver, wherein the driver can not enter through the opening and into the retainer cavity when the plug is in its second rotated position; and

5) a change tool slot configured parallel to the longitudinal axis, that extends from the front face of the plug and intersects a portion of each of the plurality of retainer cavities;

e) ~~one~~ a separate change tool having a blade portion with an upper edge that intersects all of the plurality of retainer cavities when the change tool is inserted within the change tool slot;

f) a plurality of tumblers, each tumbler being positioned and movable within one tumbler chamber; and

g) a plurality of lock configuration change balls, each change ball being associated with one pin chamber, having a first position within the pin chamber between the driver and tumbler, and a second position within the retainer cavity,

wherein when the plug is in the second rotated position and the change tool is inserted within the change tool slot, none of the plurality of change balls can be disposed in the second position within the plurality of retainer cavities.

82. (previously presented) The changeable lock assembly of Claim 81 wherein the lock is operable with a user key only when the change tool is remote from the change tool slot.

83. (currently amended) The changeable lock assembly according to Claim 81 wherein the upper edge of the inserted change tool raises at least the centerline of all of the plurality of change balls, when disposed in ~~all of~~ the respective retainer cavities, above the shear line.

84. (new) The changeable lock assembly according to claim 1, wherein the separate change tool is a single separate change tool.